Awareness of Most Commonly Used Drugs in Dentistry Inducing Teratogenic Effects among Dental Practitioners

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Abstract

Aim: The aim of the study was to assess the awareness of most commonly used drugs in dentistry inducing teratogenic effects, among dental practitioners. Birth defects may be caused by many factors such as physical conditions, teratogens, environmental exposures, genetic defects, etc., Although prescription drug use is common during pregnancy, the human teratogenic risks are undetermined for more than 90% drug treatments approved in the USA during the past decades. A particular birth defect may have its origins through multiple mechanisms and possible exposures including medications. A specific chemical process may result in different outcomes depending upon factors such as embryonic age at which a drug is administered, duration and dose of exposure and genetic susceptibility. Estimating the risk of fetal malformations attribute to the use of medications is difficult and perception of risk by health professionals will impact their counseling and treatment of patients. Pregnancy is a unique physiologic condition and importantly specific drugs like folic acid use may have several benefits for pregnant mother. The patient should maintain a good gynecologist-patient-Dentist communication. For example a woman with two spontaneous abortions would be expected to be skeptical of any drug therapy in her next pregnancy and by communicating this to physicians and respective clinician. She may influence the physician and dentist perception. The clinician should be aware of all the newer drugs and its teratogenic effects. For health professionals this includes awareness of specific drug information and sources that provide realistic descriptions of risk beyond product monographs. A greater focus on this aspect may act to balance Risk perceptions. Physicians and dentists need to weigh risks and benefits of drug prescribing to pregnant patients based on the available knowledge.

Keywords: *Pregnancy, trimesters, medications, teratogenic effects, Dental practitioners.*

Introduction

Pregnancy is a most important and special physiologic condition. The drug treatment and prescription of the drugs is a special concern in pregnancy because the physiology of the pregnancy affects the pharmacokinetics of the medications used[1]. Certain medications can reach the fetus and cause harm to the fetus [1]. Pain is a main symptom of the upcoming complexity. Relieving a pain of the patient is the main duty of the doctor. We shouldn't ignore the patient just because the patient is pregnant. The complete ignorance of pharmacological treatment in pregnancy is not possible because some women enter pregnancy with certain medical conditions that requires episodic treatment[1]. Management of pregnant women in dental office is challenging. The clinician should know the proper prescription and should give proper treatment according to their medical history and trimester [1]. In pregnancy, drug treatment presents a special concern due to the threat of potential teratogenic effects of the drug that causes damage to the fetus [1, 2]. History dates back, pregnant woman who ingested thalidomide gave birth to children with phocomelia, but the same drug is now being used for several oro-erosive lesions. After all these dangerous events happened in 1979 [1,2]. Food And Drug Administration developed a system that determined the teratogenic risk of drugs by considering quality of data from clinical and human studies, the pregnancy categories are A,B,C,D, X [1]. The dentist should be aware of prescribing the drugs to the pregnant woman is a prime concern [1, 2, 3,]. The patient should maintain good gynecologist-patient-Dentist communication. The communication helps to avoid more problems and that could enhance effective treatment.

Materials and Methods

A questionnaire based study was conducted in about 60 dental practitioners who had clinical experience of over 10 years. The study was conducted with their complete concern knowledge. The questions were got approved from the department of oral medicine and radiology- Thai moogambigai dental college and hospital. All practitioners in this study completed a paper based questionnaire consisting of 10 questions with 4 options. The questionnaire was printed and distributed to Thai moogambigai dental college practitioners and Maduravoyal dental practitioners. In this study 35 female practitioners and 25 male practitioners were participated. Particularly 47 specialized practitioners and 13 general practitioners. This study was conducted in practitioners who had clinical experience over 10 years of general and specialized. It excludes fresh practitioners and practitioners who had less than 10 years of clinical experience. The subjects were briefed about the study and informed consent obtained from them. Ethical committee approval was obtained from the university. First part of the questionnaire consists of demographic details of subject's age, gender, clinical experience, and qualification. The questions in the questionnaire were designed to assess their knowledge. The data were analyzed using the excel 2013 software.

Results

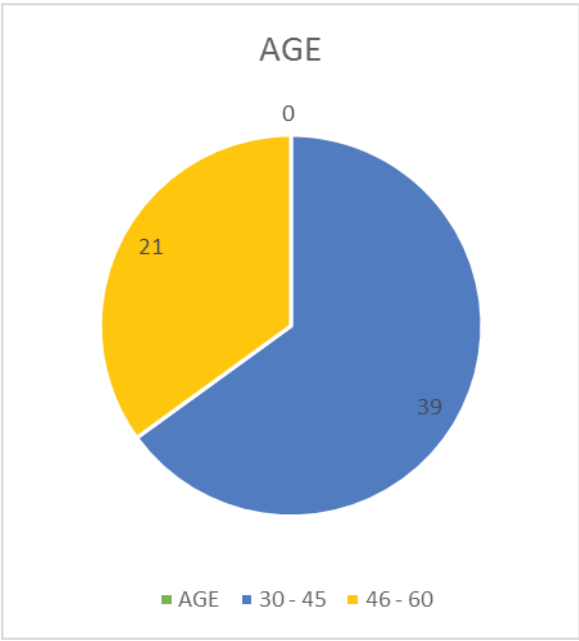
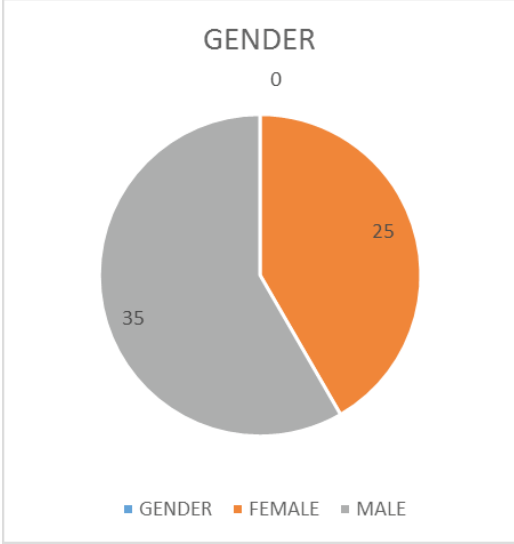


Figure: 1



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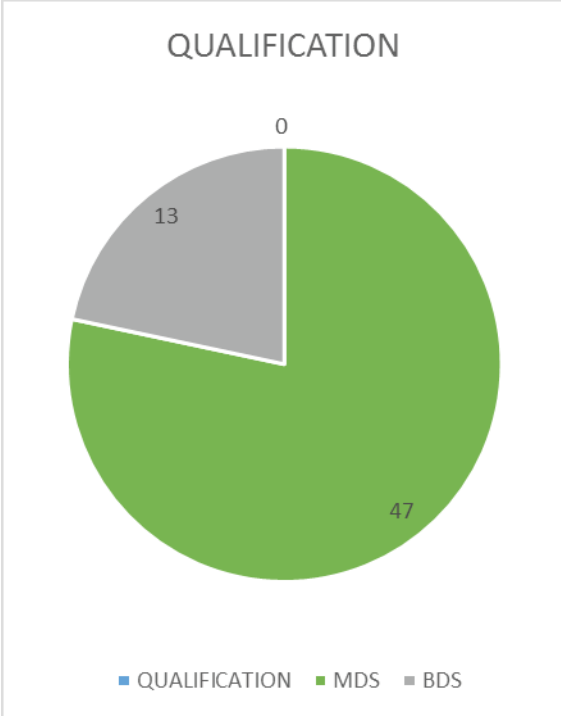

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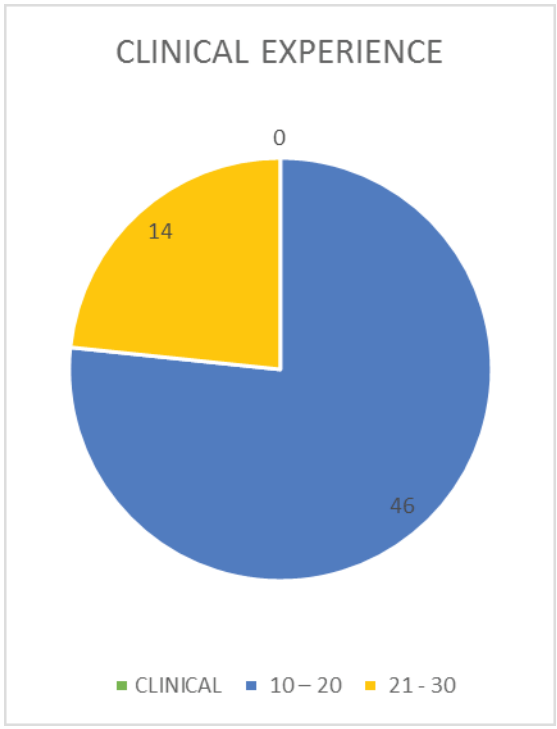

Figure: 4

To question number 1, among 60 dental practitioners, 83.3% of the responders give their answer as don't know whereas 16.6% responders are aware that Mepivacaine induced fetal bradycardia. To question number 2, among 60 dental practitioners, 78.3% practitioners prescribed Acetaminophen to pregnant women. To question number 3, among 60 dental practitioners, 20% of the practitioners are not prescribing Thalidomide to their pregnant patients To question number 4, among 60 dental practitioners, 91.6% of practitioners do not prescribe opioids to their patients since it can cause severe teratogenicity and neonatal abstinence syndrome. To question number 5, among 60 dental practitioners, 78.3% of the practitioners didn't prescribe Prilocaine to their patients, because it can induce methemoglobinemia. To question number 6, among 60 dental practitioners, 91.6% of the practitioners prescribed Amoxicillin to their patients. In human studies amoxicillin didn't show any teratogenic effects. To question number 7, among 60 practitioners, 93.3% are not prescribing Aspirin to their patients, because it can cause serious teratogenic effect which is premature closure of ductus arteriosus. To question number 8, among 60 practitioners, 86.6% practitioners are not prescribing Ciprofloxacin to their patients, because it can induce fetal hepatotoxicity. To question number 9, among 60 practitioners, 61.6% of the practitioners are not prescribing Fluconazole to their patients because it can cause teratogenic effects. To question number 10 among 60 practitioners, 90% of the practitioners do not prescribe nitrous oxide sedation to their patients as it can cause serious birth defects and spontaneous abortions.

Discussion

Pregnancy and child birth is one of the most beautiful phases a women goes through. Although being a wonderful phase, a woman has to go through a lot of discomfort and pain. As it is a physiologic journey, other concerns of pain also affects the individual like tooth ache etc.., Hence when a pregnant women comes for a treatment not only the discomfort should be eliminated, it should be eliminated without causing any harm to the fetus. Mepivacaine and Bupivacaine are considered in category C and should not be used during pregnancy [8]. Both have shown to cause fetal bradycardia [2] and embryocidal effects at early stages in the gestational period. According to the recent study 83.3% of the practitioners given their answer as don't know to the question "does mepivacaine induce fetal bradycardia?". Drugs like Thalidomide has caused a huge disaster past causing phocomelia [1, 4,] and hence its usage with pregnant women has stopped by 20% practitioners [4]. Opioids can cause neonatal abstinence syndrome, hence 91.6% of the practitioners do not prescribe opioids to their patients [16]. Prilocaine is not used frequently due to its association with methemoglobinemia- induced fetal hypoxia and hence 78.33% of the practitioners didn't use prilocaine to their patients [8]. Amoxicillin is considered as the safest antibiotic and hence 91.6% of the practitioners prescribe amoxicillin to their patients [5]. Aspirin and other salicylate group cause delay in sort of labor, premature closure of ductus arteriosus, jaundice etc., [1, 11].According to the recent study 93.3% of the practitioners do not prescribe Aspirin to their patients. In albino rat study, Ciprofloxacin showed spontaneous abortion. In human study, Ciprofloxacin crosses the placenta and concentrates in amniotic fluid which leads to fetal hepatotoxicity [15]. Hence 86.6% practitioners do not prescribe Ciprofloxacin to their patients. Antifungal drugs like Fluconazole and Ketoconazole cause birth defects[13].According to the gynecological study, 2% of the fetus presents with neural tube defects, so 61.6% of the practitioners do not prescribe Fluconazole to their patients. Use of Nitrous oxide sedation is very dangerous to pregnant women and it also causes abortions, hence 90% of the practitioners are not recommending nitrous oxide [17] sedation to their pregnant patients.

Conclusion

The results of this survey showed an acceptable level of awareness about drugs that inducing teratogenic effects among dental practitioners. It also showed that clinician should know about all the newer drugs and its significance. The outstanding nature of physiology of pregnancy presents challenges for pharmaceutical treatment for acute and chronic as well as oral problems and the pain management of many complains associated with pregnancy. From the clinician to till the pharmacist should have responsibility to prescribe drugs to pregnant woman because fetal safety is most important one. The drugs termed as over the counter (OTC) should be avoided during pregnancy and the clinicians also not recommend that drugs to pregnant woman. As Dentist part, relieving tooth pain and any other oral pain is mandatory one. The clinician should know the newer drugs and its teratogenic effects. This all can improve clinical practice among dental practitioners.

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Ethical Clearance: Ethical committee approval is obtained from the university (DR.MGR EDUCATIONAL AND RESEARCH INSTITUTE, MADURAVOYAL CHENNAI.)

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